JAMAICA.

ANNUAL REPORT

OF THE

Department of Agriculture

FOR THE

YEAR ENDED 31st MARCH, 1941.

Ordered by His Excellency the Governor to be Printed.

PRINTED BY
THE GOVERNMENT PRINTER,
DUKE ST., KINGSTON.

1941.

CONTENTS.

	Page.
SECTION I.—AGRICULTURE IN THE COLONY.	1
SECTION II.—WORK OF THE DEPARTMENT OF AGRICULTURE.	
A.—Public Gardens:	
(i) Report of the Superintendent Public Gardens and Horticulturist.	3
B.—Agricultural Experiments, Education and Field Services:	
(ii) Report of Superintendent, Experiment Station, Hope	4
(iii) Report of Superintendent, Sugar Cane Experiments	4
(iv) Report of Headmaster, Jamaica School of Agriculture	5
(v) Report of Farm Superintendent	5
(vi) Report of Agricultural Superintendent, Government Stud Farm and Experimental Station, Manchester	5
(vii) Report of Senior Veterinary Officer	6
(viii) Report of Supervising Inspector of Plant Diseases	6
(ix) Report of Acting Agricultural Superintendent	7
(x) Report of Crop Development Officer	7
(xi) Report of Chief Inspector of Produce	7
C.—Research and Laboratories:	
(xii) Report of Government Chemist	8
(xiii) Report of Entomologist	9
(xiv) Report of Agricultural Chemist	11
(xv) Report of Government Botanist	12
(xvi) Report of Plant Pathologist	13
(xvii) Report of Leaf Spot Control Officer	14
(xviii) Report of Leaf Spot Mycologist	15
D.—Forestry:	
(xix) Report of Conservator of Forests	15
E.—Publications:	
List of Departmental Publications issued	21
SECTION III.—LEGISLATION.	
Summary of Legislative Changes affecting Agricultural Industries	21

APPENDICES.

1. Food Production:	
Report of Live Stock Officer	23
2. Agriculture in the Turks and Caicos Islands:	
Report of the Agricultural Officer	23
3. Sugar Control Board:	
Annual Report 1940-41	24

ERRATA.

Annual Report of the Department of Science and Agriculture, Jamaica, for the period 1st January, 1939, to 31st M
1940.

p. 3, line 21. *For* 300,000 acres *read* 201,000 acres.

p. 14. The figure 3,752 given in the column "Gross Exports" should be under the column "Net Impor
Exports" in heavy type.

DEPARTMENT OF SCIENCE AND AGRICULTURE.

Report for the Year ending 31st March, 1941.

SECTION I.—AGRICULTURE IN THE COLONY.

---

accordance with instructions from the Secretary of State for the Colonies this Report is presented in an abridged

e policy of the Department as set out in last year's report remained unchanged and the activities of the ment have been directed along the lines indicated therein.

Weather.

nearly all areas the total rainfall for the period under review was normal but the distribution was extremely and in some parishes, notably Portland and St. Mary, severe floods caused loss of life and destruction to ty.

o hurricanes were experienced during the year.

General.

he effect of the hurricane experienced in November, 1939, was felt throughout 1940 and caused a serious falling the exports of bananas and the production of coconuts. The sugar cane crop of 1939-40 was also unusually when account is taken of the additional area planted. This was due to the poor growing season of 1939.

Food Crops.

he Food Production Campaign started in September, 1939, was largely frustrated by the abnormal weather enced, and in many instances crops were a failure. In June of 1940, it was considered necessary to intensify od production effort and the Board was reconstructed and given executive powers. By extensive propa- methods—the holding of public meetings, use of the press and the radio, by the Board itself undertaking in n instances to plant areas in food crops, by the hearty response of a large number of landowners, coupled with sed credit facilities made available by Government to all desiring to plant such crops—the year closed with y large quantity of locally grown food crops becoming readily available.

Unfortunately, this period of abundant supplies coincided with a period when the local markets became glutted bananas which, owing to war conditions, could not be shipped. The result has been a temporary surplus of

Bananas.

During the year information was received that no bananas would be shipped to Great Britain. The Imperial rnment, however, undertook to pay for a maximum of 12,000,000 stems at 3/- per count bunch.

The local Government arranged to purchase all sound, full fruit and to export as large a quantity as possible anada and the United States of America. In spite of the willing co-operation of the United Fruit Company roviding ships, it was found impossible to market all the fruit offering and large quantities were left for local osal.

The quantity of stems actually exported during 1940 was 6,849,042 valued at £1,045,480 compared with 71,628 stems valued at £2,439,177 in 1939.

Most of the large growers now recognise that owing to Leaf Spot Disease spraying is necessary. The smaller ers find it extremely difficult to adapt themselves to this necessity and large numbers are rapidly going out of vation, and this in spite of the fact that Government is providing free equipment and spraying materials.

Investigations have been continued and considerable additions to our knowledge of the causative organism ed. The behaviour of different stages of the fungus is being studied by the Mycologist of the Leaf Spot Control ision with special regard to methods of infection and most efficient means of control.

In spite of the efforts to restrict its spread, the incidence of Panama Disease increases and numerous large fields he main banana areas have been thrown out of cultivation.

The efforts to produce a resistant type of banana which will at the same time retain the characteristics of the s Michel continue. Larger numbers of seedlings are now produced annually than was possible in the early years his work. By persistent effort it is hoped eventually to achieve success. The need is great and pressing.

Sugar and Rum.

For the first time for many years the value of sugar and rum exported from Jamaica exceeded that of and the sugar industry thus becomes once again the major industry of the Island. The export figures in q and value for 1939 and 1940 are as follows:—

	Sugar.		Rum.		Total.
	Tons.	Value.	Gals.	Value.	Value.
1939 ..	103,783	£989,563	839,467	£247,047	£1,236,610
1940 ..	81,469	£848,431	1,065,720	£338,286	£1,186,717

Whilst the export figures for 1940 show a decline over those for 1939, this was due to unfavourable growi ditions experienced during 1939. The growing season of 1940 has been more favourable and a total pro of 157,000 tons of sugar is anticipated of which some 137,000 tons will be exported.

There was a remarkable increase in the number of persons supplying cane in 1940 and a very large nu additional farmers were registered for supplying cane for the 1940-41 crop. Cane farming is becoming important factor in the local sugar industry and is being encouraged by the manufacturers.

The value of exports of rum increased by close on £100,000 over the previous year.

Citrus.

Owing to shipping difficulties the exports of grapefruit were seriously reduced, but oranges were export mally. There was a slight increase in the quantity of orange oil exported. The orange crop was purchased British Government. No shipments were made to New Zealand.

The export figures for 1939 and 1940 are as follows:—

	Oranges.		Grapefruit.		Orange Oil.	
Year.	Packages.	Value.	Packages.	Value.	lb.	Value.
		£		£		£
1939	318,084	113,989	172,488	52,903	50,966	13,177
1940	269,298	103,896	44,620	13,264	61,330	20,532

Grapefruit scab is causing some anxiety in certain restricted areas but is satisfactorily controlled by juc spraying. The "Marsh" grapefruit is more susceptible than other varieties.

Mr. R. G. Fennah, Entomologist, Citrus Pests Investigation, Windward and Leeward Islands, visited Ja during the year. The purpose of the visit was to establish the extent of damage to citrus by Fiddler B (*Prepodes* spp.), to note other forms of damage or unthriftiness likely to be attributed to attack of these beetl to publish recommendations or suggestions best calculated to alleviate the maladies observed. Mr. Fennah's has been published and is a valuable contribution to our knowledge of the many problems facing those enga this industry. There is need of further research more particularly in the botanical aspects such as compat of stocks and scions.

The Department continues to maintain extensive nurseries to supply budded plants to growers. The many districts in Jamaica where citrus could be successfully established to take the place of bananas.

Coconuts.

The complete re-organisation of the coconut industry has had the desired effect of restoring confidence to a depressed section of the planting community. The successful merger of a number of large producers of refine soap and other products and the establishment of a Coconut Industry Clearing House has accounted for beneficial change.

The Bronze Leaf Wilt trouble in the West End of the Island reported on by Bain in 1939 continues to concern. There is also some drop in output in other sections of the Island following the storm of 1939, but t of a temporary nature only. With the getting together of the producers on the marketing end of the industry reasonable to expect that attention will now be given to the cultural side. There is room for much improveme this direction.

Pimento.

A drop from 8,000,000 pounds valued at £207,000 in 1939 to 3,500,000 pounds valued at £119,000 in 19 a serious blow to those engaged in the production of pimento. This was due to unfavourable climatic condi at the critical flowering time and to the prevalence of the "Rust" disease which has caused so much loss in ce of the parishes.

Honey.

Honey producers have had a good year when exports increased from 98,880 gallons valued at £13,049 in to 145,700 gallons valued at £61,457 in 1940.

An enquiry has been held as to the desirability of grading and standardising Jamaica honey to ensure a r uniform product. An officer of the Marketing Department visited Canada to study the methods adopted in country. The matter is still under consideration.

The American Foul Brood Disease of Bees has always been a source of trouble to Jamaica beekeepers. Effec control of this disease is aimed at by a scheme involving the registration of all colonies of bees kept by apiarist that the danger of spread in any locality can be readily estimated and the necessary precautions taken. The sch was put into operation in the middle of 1940.

Other Crops.

In spite of the shipping difficulties attendant on the crucial stage of the war, Jamaica has been fortunate in b able to move most of its minor items of Island produce. Ginger, Dyewood Extracts, Coffee, Cocoa, Annatto Limes continued to play their part in adding to the revenue of the planters of the Colony.

persistent work of the Jamaica Vegetables, Ltd. operating in the Bull Savannah district of St. Elizabeth, deavour to establish a tomato industry in that previously depressed area is worthy of record. Over 40,000 re exported to Canada in 1940-41 as compared with 14,000 cases in 1939-40. A cannery is also in operation ction with the Bull Savannah tomato scheme.

Livestock.

siderable attention is being given to livestock problems and the trend towards mixed farming has become ticeable in most districts. Full advantage was taken of the free services afforded by the 40 livestock improve- ntres installed by the Department during the past two years. By this means better bred animals will be made e and of equal importance is the educational value of these centres.

irying has been emphasised owing to the ready market which now exists for disposing of surplus milk produced large and small farmers. The Bog Walk Condensery has had a successful year of operation and by its sive policy of facilitating producers in every way possible has stimulated production far beyond the original es. The Island is now producing about half its condensed milk requirements.

Agricultural Education.

close collaboration with the Jamaica Agricultural Society, by the use of the press and of the local Broadcasting , the public was kept informed of agricultural developments. The Grove Place Experimental Station is a centre of Agricultural Education. The Jamaica School of Agriculture continues to attract a large number nts. A record number of Jamaica students are now undertaking a course of training at the Imperial College ical Agriculture in Trinidad.

Forestry.

eady progress is made with the acquisition of land for forest reserve purposes. The Division is also actively d in defining the boundaries of existing reserves. The difficulty of obtaining imported timber has increased mand for local supplies of hardwood which has led to widespread cutting of trees. The Forestry Division in ration with the Agricultural Society is fostering the replanting of trees by providing seedlings from Govern- urseries.

tter control of Crown Lands by closer collaboration with the Lands Department has been made possible by ngement of the field staffs of the two departments.

G. A. Jones,
Director of Agriculture.

SECTION II.—WORK OF THE DEPARTMENT OF AGRICULTURE.

A. Public Gardens.

(1) *Report of the Superintendent Public Gardens and the Horticulturist.*

Hope Gardens.

he Orchid collection has been maintained in a satisfactory condition. Amongst the large number of blooms, blooms of Cattleyas and hybrid Cattleyas were displayed in the Orchid House. Orchid seedlings of hybrid yas are again being raised by the asymbiotic method.

he Cactus Garden has been extended and several additions were made to the plant collections. A total of 657 of flowering trees was distributed to the schools throughout the Island for planting in the school grounds on re Day.

our additional Solar Propagators were built to facilitate the propagation of plants.

rnamental balustrades were erected on both sides of the bridge which crosses the water canal on the central and a "shelter" for visitors was built at the main entrance.

total of 40,727 plants was distributed during the period under review. Of the number 32,308 were sold and were free grants. The total amount for plants sold during the year was £346 7s. 10.

Castleton Gardens.

he lawns along the riverside have been extended and several new plants have been added to the plant collection.

fter fifty-four years of service at Castleton Gardens, Foreman Victor Terrelonge retired on 31st July, 1940.

King's House Gardens.

hese gardens were well maintained throughout the year. The widening of the bridge crossing the gully just e the west entrance made it possible to extend the shrubberies on both sides of the drive. The pastures adjoining ardens were cleared of bush and odd trees with the object of incorporating the pasture lands with the Gardens scape.

Kingston Public Gardens, Cinchona Hill Gardens, Bath Gardens, St. Thomas, and Gordon Town Garden.

These Gardens were maintained in a satisfactory condition during the year under review.

Rainfall.

	Hope Gardens.	Castleton Gardens.	King's House Gardens.	Hill Gardens Cinchona.	Public Gardens Kingston.
	Ins.	Ins.	Ins.	Ins.	Ins.
Total	53.49	190.03	39.93	96.74	23.53

M. S. Goodman,
Superintendent Public Gardens,
E. J. Downes,
Horticulturist.

B. Agricultural Experiments, Education and Field Services.

(ii) *Report of the Superintendent Experiment Station, Hope.*

Weather.—The rainfall at the Station for the period under review was 53.49 inches. This was well distri over the year and is slightly above the average for fifty-nine years.

Distribution of Cane Varieties.—During the year 300,286 tops and cuttings were distributed. Of this 32,925 were distributed from the Cornwall Nursery and 64,932 from the Cow Park Nursery. Only varieties res to Mosaic Disease are distributed to Small Cane Farmers.

Mosaic Disease Tests.—All cane varieties received from the West Indies Cane Breeding Station, Barl are tested at Hope for Mosaic Disease as soon as material is available from the Cow Park Nursery. This thirty-one varieties were tested; twenty-six proved very susceptible to Mosaic and five resistant.

Citrus.—A fairly large number of Budded Navel and Valencia orange plants were sold during the year.

Mangoes.—During October the Mango trees flowered and produced an out-of-season crop which was dest by the West Indian Fruit Fly.

Diseases.—Mosaic Disease was prevalent in the susceptible cane varieties. Eye-Spot occurred chiefl F.C.916 and B.3013 but not severely.

Cow Park Nursery.—All cane varieties received from the Plant Quarantine Station, Trinidad, are sent to this Nursery for propagation. Cane varieties from this nursery will in future be sent to estates to be u Observation plots where any varieties with undesirable qualities will be discarded before the plants are set o trial plots. The plots of these varieties at Cow Park Nursery will also serve as Observation plots. The follo seedlings have been discarded from the collection: B.35200 and B.3215.

The following varieties are in Observation plots and will be sent to Estates to be also grown in Observ plots and Mosaic Disease Tests: B.3327, B.3521, B.3525, B.3482, B.3575, B.3520, B.3419, B.3540, B.3371, B. B.35247, B.37259, B.35197, B.37161, B.37154, B.37164, B.35214, B.37193, B.35221, B.37176, B.37194, B.3 B.37172, B.37181, B.37174, B.35179, B.37219, B.34213, B.37227, B.35245.

The following varieties have been extended for the first time and will be later further extended in Observa plots when material is available: B.34120, B.37157, B.37175, B.37163.

The following varieties were received from the Plant Quarantine Station: B.38260, B.38203, B.38192, B.3 B.38270, B.38202, B.38154, B.38209.

M. S. Goodman,
Superintender

(iii) *Report of the Superintendent of Sugar Cane Experiments.*

The rainfall covering the period of the crop reaped 1940 was better than the period for the crop of 1939; the distribution was probably one of the worst on record.

The drought started at the beginning of the year and lasted until mid-October in some areas, with the re that all cane cultivations depending on rainfall were extremely backward. Very heavy rains started during latter part of October and during November high winds approaching hurricane force and torrential rains w experienced. The canes in most areas were badly blown down and damaged.

Production.—The output of sugar for 1940 was 99,283 tons. This is 15,596 tons less than the year befor spite of a greater rainfall and a larger acreage in 1940. The reasons for the decrease were poor yields and low suc and purity of juice. There was a large quantity of Wet Sugar manufactured as the price was good.

It is estimated that the 1941 crop will be over 150,000 tons.

Varieties.—Several new seedling canes were set out in Variety Trial Plots in comparison with the stand canes of those areas.

The varieties used were: B.3439, B.3013, P.R.803, B.3254, B.35187, B.34110, B.35204, B.34104, B.34117. T varieties used as comparisons were: B.H.10/12, F.C.916, Co.281, P.O.J.2727. B.H.10/12 is still the outstand cane among all varieties and occupies over 40% of the area in cane. Owing to its good factory qualities, ma planters prefer this variety even though it is susceptible to Mosaic.

M.P.R.28 demands a rich alluvial soil in which it gives good results both as plants and ratoons. The sucr and purity of the juice are excellent.

F.C.916 is adaptable to a wide range of soils. It gives a good tonnage but the juice is not at its best until l in the reaping season.

B.3439 as a plant cane has given good tonnage, but has not yet been tested as ratoons. It is resistant to Mosa matures early, has good sucrose and juice purity and is apparently suitable to a wide range of soils.

P.O.J.2878 and P.O.J.2727 are not increasing in area but will continue to be planted in Mosaic Disease are and on shotty soils until substitutes can be found to take their places.

B.2935 and B.3124 have proved unsuitable to Jamaica conditions and their cultivation has been discontinue

Again the third largest planting was in mixed varieties. This will continue until all the old ratoon fields ha been thrown out and replanted with new varieties.

Yields.—The yields of cane per acre, both as plants and ratoons, were on the average, much below that of la year owing to the prolonged drought which was experienced during the greater part of the year. The use fertilizers has increased by over 50% in the last four years.

Cane Farming.—Small cane farmers now produce 25% of the cane ground by the factories. This does n include the large amount of cane used for manufacturing wet sugar.

Experiments.—Manurial and Varietal Experiments are in progress on several Estates throughout the Islan

Factories.—The Vale Royal Factory completed building operations late in the season, but owing to the sho crop reaped it was able to take the crop off in record time.

Diseases and Pests.—Estates in Mosaic Disease areas prefer to plant Mosaic-resistant varieties rather th susceptible varieties with their better juice and tonnage and this saves the expense and trouble of rogueing.

There were several outbreaks of Eye-Spot disease on a few estates during the Fall of 1940 and early 1941. Th was chiefly on the variety F.C.916.

The Moth Borer was very evident both in the field and at the factory in some of the new seedling canes.

Miscellaneous.—Dr. A. E. S. McIntosh of the West Indies Cane Breeding Station visited Jamaica in Octob He visited most of the sugar estates in the Island, and also saw the Variety Trial Plots on the estates, the Experime Station at Hope, and the Cow Park Nursery.

M. S. Goodman,
Superintendent.

(iv) *Report of Headmaster Jamaica School of Agriculture.*

nrollment.—Enrollment during the year averaged 59 students of which number 18 students were recipients of rships. Scholarships to the school were awarded for the first time to students from the Dint Hill Practical ng Centre.

raduation.—The Annual Graduation was held on the 4th July, 1940. The Hon. Noel B. Livingston, Custos ngston presided and presented Diplomas in Practical Agriculture to 17 students.

Health of Students.—The health of students was uniformly good but there were outbreaks of Mumps and Measles the Christmas Term.

cholastic Work.—The various courses of study outlined in the curriculum were followed in keeping with the ished policy of the School.

Non-Scholastic Activities.—The Jamaica School of Agriculture Branch of the Student Christian Movement and over Crew have been active. The School team took second place in the Evelyn Cup Cricket Competition.

dvisory Board.—One meeting of the Jamaica School of Agriculture Advisory Board was held during the year.

Staff.—The staff changes during the year included the replacement of Mr. D. J. McKinlay, B.Sc., by Mr. H. C. , D.I.C.T.A., of Mr. V. A. Valentine by Mr. C. F. McDonald, B.Sc., and the addition of Mr. E. D. H. Weller, .T.A.

J. W. Howe,
Headmaster.

(v) *Report of Farm Superintendent.*

Weather.—Total rainfall for the year was 53.49 inches, distributed over 109 rainy days.

Live Stock.—Total head of live stock as at 31st March was 456. Poultry numbered 102, exclusive of Baby Chicks he total valuation of all live stock was £6,687 13s. 2d.

Health of live stock has been good.

Sales of live stock totalled 183 including 104 calves sold for rearing, two sold to the butcher and 77 head grown

Sales of poultry included 24 mature birds, 93 baby chicks, 20½ dozen eggs for hatching, and 312 dozen for table

Dairy Produce.—Milk production totalled 301,439 quarts of which 272,005 were sold. A total average of 199 were milked giving an average production per cow of 4.2 quarts. The average butterfat content was 4.85%.

Experiments.—Promising experimental work which should be followed up included the use of Uba Cane chaffed green cuttings of Pigeon Peas as a substitute for green fodder during the drought, and the use of young Guinea s chaffed with Uba Cane for the making of silage.

Palatability trials with a variety of imported fodder crops were also initiated.

Extension Work.—The usual advisory work including replies to requests for information on live stock and nstrations to visitors to the Stock Farm has been maintained.

J. W. Howe,
Farm Superintendent.

(vi) *Report of Agricultural Superintendent, Grove Place Stud Farm and Experimental Station.*

In addition to my duties as Superintendent of Grove Place, I assisted in the Livestock Division as Livestock Field er for the Central Division.

A. Weather.

The rainfall for the calendar year 1940 was below that of the previous year, there being 61.81 inches, as compared 79.10 inches in 1939. There was, however, a better distribution.

B. Experimental Station.

All sections of the Station were maintained during the year. The long-range fertilizer experiments in connection citrus and bananas, which were started in 1935 and 1937, respectively, were continued in collaboration with the cultural Chemist and the Senior Agricultural Officer. These trials have progressed sufficiently to indicate the e of certain treatments, especially in the case of the bananas.

Fertilizer Trials with maize, sweet and Irish potatoes, soya and red peas and Spacing Experiments with maize continued under the direction of the Agricultural Chemist. Some of these trials were conducted in collaboration private farmers, as a check on the results obtained at Grove Place.

1. *Citrus.*—The majority of the trees yielded their second crop during the year. These were gathered and the ssary records made for analysis. Maturity tests were conducted by the Agricultural Chemist. The survey he control of Fiddler Beetle and Slug was continued. The roots of all trees were exposed as a prevention against ttack of the beetle. Measurements of trees and application of fertilizer were continued according to plan.

2. *Bananas.*—The fertilizer experiment was conducted according to plan. During 1939 a spacing experiment laid down under the direction of the Agricultural Chemist. The plant crop was reaped during the year under w and the necessary records made for analysis.

3. *Avocado Pears.*—During the year an observation plot consisting of three acres was established, comprising een budded and five seedling varieties.

4. *Fodder Crops.*—In addition to the established crops, viz.: Guatemala Grass, Uba Cane and Alfalfa, fully new varieties were introduced during the year.

5. *Nursery.*—This now consists of citrus, coffee, cedar and bitter damsel seedlings. The cedars have been blished for reafforestation on the hillsides of this property.

C. Livestock.

All classes of livestock maintained good health, except the goats, many of which developed an unthrifty condition ng the winter months. All young stock were vaccinated against Black Leg, and the entire herd against Anthrax. various animals at the Piggery were vaccinated against Hog Cholera.

The policy of grading up the cattle was continued, and there are now some very fine high grade and Montgomery- y heifers at the Farm.

The Stud Farm received increased patronage, and great interest is being manifested throughout the Division he livestock industry.

D. Agricultural Education.

The Senior Students of the Jamaica School of Agriculture attended for the usual course in Practical Agric the course extending over two periods of five and ten weeks respectively.

Several Field Days for Agriculturists were observed and four lectures delivered at Agricultural Meetin

L. A. Powell,
Actg. Superinten
9.5.41.

(vii) *Report of Senior Veterinary Officer.*

I.—Disease Control.

Efforts were made throughout the year to promote and protect animal health and thereby conserve and in the domestic supply of meat, milk, hides, skins, under existing war conditions.

Field Operations.

1. *Diseases notifiable under the Law, Chapter* 80:—
   (i) There were no outbreaks of such scheduled diseases during the year, except swine fever (hog ch
   (ii) Swine Fever existed for variable periods in (a) eastern St. James and Western Trelawny, (b) seven di of St. Thomas and (c) sporadically in Corporate Area of Kingston and St. Andrew.
2. *Non-Notifiable Infectious and Parasitic Diseases*:—
   (i) *Bovine Tuberculosis.*—A survey by intradermal tuberculin test was made for the incidence of tion in 29 dairy herds involving 2,556 cattle. Result 0.27% infection.
   (ii) *Blackleg.*—Outbreaks were dealt with in the area of (a) Wakefield and Spring Vale (St. Th in-ye-Vale), (b) Golden Vale (Portland), (c) Walton, Bull Savannah, Lititz and Myersvill Elizabeth); (d) Mt. Airy (St. James); (e) Hartlands (St. Catherine). Control by general vacci in these and other known areas of soil infection was carried out with good results.
   (iii) *Tick Fevers.*—(a) Texas Fever (*Piroplasmosis bigeminum*)—recurrent outbreaks affecting s cattle were reported and dealt with at Edinburgh Castle, Bellevue, Goshen and Up-Park in St
   (b) *Anaplasmosis* (Gall Sickness or Yellows)—A score or more acute cases occurred at G and Up Park, (St. Ann), a few at Marshall's Pen (Manchester) and single cases at Dinthill an Olive (St. Catherine).
   (iv) Ulcerative *Lymphangitis* (so-called Jamaica farcy).—See previous annual reports.
   (v) *Haematuria vesicalis* of cattle.—This obscure bladder disease still continues in parts of Sou Manchester and glade lands of the Claremont-Mammee Ridge area of St. Ann. See previous a reports.
   (vi) *Actinomycosis* appears, because of seasonable variations in fodder or some other cause, to be prevalent than in former years.
   (vii) *Helminthiasis* (gastro-intestinal) of calves and goats.—Farmers are now becoming more imp with the havoc caused by such parasites in calves and goats.
   Due to the reduction of their milk ration incident to demands for more market milk and su to the Condensery at Bybrook, the calves of milk-supplying herds are having a hard time, espe so when infected with worms (stomach, intestinal, lung, etc.) The same conditions more o affect kids, because more goats are being kept in a given area and more small settlers now milk goats.
   (viii) *Necrobacillosis* of muzzle of goats was widespread on the Liguanea Plain (St. Andrew), lowlar St. Catherine, areas of Trelawny and around Hope Bay (Portland).

II.—Veterinary Education.

(i) Lectures and demonstrations in Jamaica School of Agriculture.

(ii) Lectures at (a) three Branch Meetings of Jamaica Agricultural Society, (b) Short Course at Hope in Jan 1941, (c) Course for Teachers in August, 1940. Two local broadcasts on animal health were given and veter problems in Jamaica were discussed with the local British Medical Association.

S. Lockett,
Senior Veterinary Officer
6.6.41.

(viii) *Report of the Supervising Inspector of Plant Diseases.*

The Inspectors of Plant Diseases carried out the treatment of Panama Disease under the one-root system. the visit of Dr. Wardlaw, Inspectors were instructed to give up treatment in areas where Panama Disease app within a chain of each other or where the infected plants were more than twenty per cent. of the healthy. They weekly reports on Leaf Spot spraying operations in their districts throughout the year.

Charlton Nursery.—The citrus nursery at Charlton was increased from twelve to thirty acres. There v distribution of some fifty-four thousand plants—thirty-nine thousand from Charlton and fifteen thousand Tamarinds.

The budding of the seedlings is now being done and it is estimated that some two hundred thousand plant be produced in the Fall of this year. The settlers' Demonstration Plot adjoining the citrus nursery has again handed over to us by the Lands Department. This area is kept for experiments on various methods of citrus cul and also to demonstrate how a settler should lay out and cultivate his holding.

The demands for Guatemala grass from this nursery were so very heavy that it was found necessary at period to limit applicants to a supply not exceeding 500 plants. Some fifty thousand cuttings were supplied. natto seedlings were also freely distributed and thirty thousand plants were supplied.

Mango Budding.—The Mango Budding Campaign on the Liguanea Plains has now come to a close. The number of trees budded is 7,202.

J. B. Sutherland,
Supervising Inspector of Plant Dise
6th May, 19

(ix) *Report of the Acting Agricultural Superintendent.*

ving to the drought conditions prevailing from January to September, the work on distribution of citrus plants this year resulted in 36,000 plants of a total of 54,054 for the period, being supplied within six weeks in r to November. Preparations were made in advance by the officer responsible and the actual oversight ost all the planting was also attended to by him.

new field was opened in the Dry Harbour Mountains (St. Ann) with a planting of approximately 4,000 plants. rish of Manchester led with 12,747 plants while St. Catherine, owing to the loss of bananas, has planted fairly vely aggregating 11,843 plants. Many owners of young groves just coming into bearing have added to their with promise of further extension as conditions admit.

and Settlements have made a start in citrus development, the foremost for the year being at Ramble (Manches- th particularly suitable natural conditions. Mocho in Clarendon also is very promising, but other settlements oving very slowly.

he crop for the year has been poor and the market depressed, much of the fruit being handled in canning and actories.

Mr. R. G. Fennah, visiting Entomologist, was taken to various centres of trouble for investigation into the lations of Fiddler Beetles.

he Manurial Plot at Wakefield, established with approximately 17 acres of citrus, has developed satisfactorily; uiting is fairly general, all fruit being removed until December since which date a good setting is recorded.

L. L. Carrington,
Acting Agricultural Superintendent.
23rd June, 1941.

(x) *Report of the Crop Development Officer.*

Avocado Pears.—1,677 budded and grafted trees, representing fourteen American varieties were distributed sket pots, 1,398 of these being planted in 16 variety trials scattered through eight parishes, and the balance sold. er investigations on methods of propagation resulted in improvements in technique, and the nursery has been ded to produce an increased output this Spring.

Tahiti Limes.—804 trees budded on rough lemon stock and 403 on West Indian Lime were sold in basket pots. isfactory technique for large scale propagation has been developed which will result in a marked acceleration ncrease in output.

Mangoes.—324 Bombay, 308 Haden and 157 Julie trees raised by means of shield budding were sold in basket Difficulties encountered in forcing buds into growth appear to have been overcome by recent modifications in gation technique.

Other Crops.—Limited work was done on pineapples, cashews and guavas.

J. K. Argles,
Crop Development Officer.

(xi) *Report of the Chief Inspector of Produce.*

1. *Activities under Produce Law.*—The enforcement of Regulations dealing with thin, immature and bruised nas resulted in a substantial increase in weight per count bunch, elimination of bruised fruit and benefit to the panies and growers.

2. *Revenue from Licenses.*—This revenue fell from £3,811 to £2,723 caused by a reduction in the cost of licences the number of such licences taken out.

3. *Court Cases.*—The number increased from 15 last year to 87, due to the enforcement of Banana Regulations; majority of cases were not, however, followed by fines at the request of the Inspectors.

4. *Detention and Destruction of Produce.*—This was less than in previous years due to reduced volume of produce better handling by both growers and exporters.

5. *General Observations.*—The quality of banana export was maintained in spite of adverse conditions. pectors assisted the Marketing Division under the new system of purchase.

Citrus.—Export fell to 280,000 boxes due to lack of shipping facilities. The British Government purchased our re orange crop. The export quality was maintained.

6. *Minor Crops.*—Cocoa export around 12,000 bags, quality good. Coffee export around 25,000 bags, quality d. Pimento export around 25,000 bags—quality good, prices excellent. Honey export around 6,000 casks, lity excellent. Tomato export around 40,000 lugs, double last year's crop, quality excellent.

7. The personnel of the Produce Board and Staff remained unchanged with the exception of Mr. Purchas who gned and whose place has not been filled.

P. W. Murray,
Chief Inspector of Produce.

C. Research and Laboratories.

(xii) *Report of the Government Chemist.*

The total number of samples and specimens analysed was 4,900 and comprised 3,628 Official Analy 1,272 General Samples.

"A"—Official Analyses.

(i)	*Police Department*—	
	Criminal & toxicological, human viscera, etc.	333
	Murders and shootings with intent	95
	Arson	58
	Assault occasioning actual bodily harm	10
	Forgery, documents	1
	Wilful destruction of property	2
	Obtaining money by false pretences	4
	Housebreaking and larceny	51
	Coins and counterfeiting implements	1,500
	Ganga and implements for smoking ganga	880
	Alcoholic liquors and implements	107
	Foods	6
	Medicines, other than patent medicines	112
	Patent medicines	48
(ii)	*Customs and Excise Department*—	
	Rum, wine and other alcoholic liquids	162
	Essences	16
	Fuel oils and gasoline	58
	Miscellaneous	25
(iii)	*Department of Science & Agriculture*—	
	Miscellanous	19
	Honey	12
	Animal viscera, cattle dips, etc.	22
	Crank case oils	23
	Brines	1
	Soils, for Arsenic content	9
(iv)	*Island Medical Department*—	
	Milks, (genuine 23, adulterated 18)	41
	Human milk (1), Condensed Milk (3)	4
	Waters, butters, medicines, etc.	11
(v)	*Department or Public Works*—	
	Waters (3), Corn (10), Clay (1), Solder (1), Oil (1)	7
(vi)	*Currency Commissioners*,—coin	1
(vii)	*Chief Censor*—Tablets	1
(viii)	*Government Factory Inspector*—Boiler Deposit	1
(ix)	*Lands Department*—Water	1
(x)	*Royal Navy*	2
(xi)	*Institute of Jamaica*—1 substance	1
(xii)	*Jamaica Agricultural Society*—Chemicals	1
(xiii)	*Kingston & St. Andrew Corporation*	3
	Total Official	3,628

"B"—General Analyses.

Fresh milks, Government Stock Farm 919, other 8	927
Condensed milk and milk powders	22
Sugars 8, rums 124, wines 2	134
Waters	29
Cattle Dips	76
Food products	9
Encrustations and corrosion on metals	13
Minerals and ores	9
Lubricating oils, and deposits from engines	11
Metals and engine parts	3
Documents (in a case of alleged forgery)	9
Animal viscera for detection of poison	1
Substances examined for poison	7
Miscellaneous	22
Total General	1,272
Grand Total	4,900

Official Analyses.

77 specimens of human viscera were analysed in connection with 101 deaths. Poison was found in 46 cases

No. of deaths.	Poison found.	Remarks.
1	Antimony	Male adult.
4	Arsenic	2 females, 2 males.
1	Cooper's Dip	Male child suicide.
5	Lysol	2 female children, 2 male adult suicides. 1 female adult suicide.
1	Croton oil	Male child.
1	Chenapodium oil	Female child
3	Glucosides	3 children.
12	Hydrocyanic acid	8 female infants, 1 male infant, 3 female adults.
1	Oxalic acid	Male adult suicide.
1	Crotonal	Female child.
1	Phosphorus	Male adult.
14	Saponins	1 male adult, 8 male children, 5 female children.
1	Zinc	1 child

115 specimens of foods analysed for poisons gave 38 positive results.

Number.	Poison Fund.
10	Arsenic—in foods and articles—suicide cases.
3	Bordeaux mixture—in waters.
5	Cresols, derived from Lysol—suicide cases.
1	Cooper's Dip in a beverage.
5	Mercuric chloride in a beverage, and glass. Mercurial ointment in yams.
2	Nitrate of Potash in bananas.
7	Powdered glass in foods.
1	Chlorinated hydrocarbons—attempted suicide.
1	Sodium fluoride—attempted suicide.
1	White lime—attempted wounding.
1	Aspirin, found in food.
1	Copperas mixed with salt.

633 certificates were issued to the Police. The Government Chemist attended various Circuit Courts throughout Island and gave technical evidence. 2 meetings of the Rum Control Board were attended.

The following articles were sold to the Public:

Arsenite of Soda	23,100	lbs.
Paranaph	42,163	lbs.
Standard Iodine	40,500	ccs.
Starch solution	183	bottles
Sodium bicarbonate	48	bottles
Carbon disulphide	1,977	lbs.
Thymol powders	166	packets
Rat poison	36	lbs.
Fly killer	468	gallons
Book poison	5¼	gallons
Rat poison, packets 1 oz.	12	packets.

Revenue derived from 1st April 1940 to 31.3.41:

Fees for analysis	Sales.	Stamp Duty.
£217 2s. 0d.	£1,393 5s. 9d.	£22 2s. 0d.

W. L. Barnett,
Government Chemist.

(xiii) *Report of Government Entomologist.*

During the period under review the Entomologist also shared the duties of the Plant Pathologist with the Botanist and supervised the Plant Inspection Service.

As from September the Entomologist was appointed Director of the Government Information Bureau for the Building Industry and Termite Control. A draughtsman, Mr. M. C. Moore was employed from July 1940 to February; whilst the Senior Technical Assistant fulfilled duties concerning the Termite Inspection Service.

Agricultural Entomology.

Sugar Cane.—Investigations were made on sugar estates regarding the incidence of pests and diseases and observations noted on the relative susceptibility of new varieties grown at the Experimental Station.

Banana.—Distribution of predators to control the Weevil Borer has been conducted on an extensive scale and a new centre of distribution established at Orange River.

Outbreaks of Red Spider *Tetranychus telarius* which occurred in St. Mary have been effectively controlled by spraying with lime sulphur.

Citrus.—Control of the Citrus Weevil received special attention. Mr. R. G. Fennah who came to Jamaica at the request of Government has submitted useful suggestions and planters are advised to follow the methods of control he has recommended whilst continuing to destroy adult weevils and egg masses.

Insect Pests.—The following insects have received attention:—

Silvanus surinamensis F. attacking Vermicelli, Corn
Coccus viridis G. attacking Citrus, Naseberry.
Aulacaspis pentagona Targ. attacking Cereus grandiflora, Bryophyllum colycinum.
Lepidosaphes beckii Newm. attacking Citrus.
Selenaspidus articulatus Morg. attacking Citrus, Oleander.
Chionaspis citri Comst. attacking Citrus.
Tarpula mutabilis Waterh. attacking Citrus (Scavanger)
Tinea pellionella L. attacking Clothes.
Periplaneta australisiae F. attacking Herbarium, Hope.
Diatraea saccharalis F. attacking Sugar Cane
Malladon maxillosum F. found in Citrus grove.
Metachroma rosae Bry. attacking Rose Bush.
Lachnopus aurifer Dru. attacking Citrus.
Erinnyis ello L. attacking Citrus.
Apate monachus F. attacking Grape
Chrysomphalus aonidum L. attacking Banana, Rose.
Cremastogaster brevisponosa Mayr. attacking Citrus.
Pseudococcus citri Risso. attacking Irish Potato.
Saissettia hemisphaerica Targ. attacking Hibiscus, Coffee Rose, Cassia.
Selenothrips rubrocinctus Giard. attacking Mango.
Componatus abdominalis F. attacking Dwelling
Margaronia hyalinata L. attacking Cucumber, Pumpkin.
Lamprosema indicata F. attacking Legumes.
Saissetia oleae Bern. attacking Poinsettia.
Heliothis absoleta F. attacking Corn.
Oiketicus abbottii Grote attacking Citrus.
Lachnosterna jamaicensis Arrow. attacking Sugar Cane.
Aphis illinoisensis Schimer. attacking Grape
Mylabris obtectus Say. attacking Peas.
Ctenophalus canis Curt. attacking Dwelling.
Strategus titanus F. attacking Sugar Cane.
Pontia monuste L., attacking Cauliflower.
Lagochirus araneiformis Sloane. attacking Dying Mango branch.
Chloridea festiva L. attacking Egg Plant.
Apate terebrans Pall. attacking Cashew.
Lasiodermis serricorne F. attacking Cigars.
Icerya montserratensis R. & H. attacking Citrus.

Control of Pests affecting Food Crops.—Pests attacking food crops received special attention and fields in r parts of the island were inspected and advice given.

Advice on the control of weevils attacking stored grain was given to the Marketing Department and to gr of corn and pulses.

Experiments to control Eelworms on the field scale by means of application of silver proteinate have not encouraging results.

Termite Control.—Increased requests for advice regarding termite control were received and inspections r of infested buildings give further evidence of the necessity of having buildings systematically inspected to en intitial preventive measures being taken.

Graveyard tests have been undertaken to ascertain the resistance of native woods to the attack of gro inhabiting termites.

Government Information Bureau for the Building Industry.

The object of this Bureau is to organise the building industry in Jamaica on fundamentally logical and econ cal lines. A grant of £365 was made by Jamaica Welfare, Ltd. to cover essential initial expenses to enable Bureau to be started. The public and various organisations have been making extensive use of its services.

Plans and other data for standard cottages which can be built very economically have been prepared and being printed. Miniature models of these cottages have been made. A small but comprehensive Museum is b erected on the grounds of the Institute of Jamaica.

The Government Entomologist has been serving on the following committees:—

Revision of the Existing Building Codes.
To submit to Government recommendations regarding grading of imported lumber and methods Storage.
To adjudicate prizes for Constructions Utilising Native materials.
To submit Suggestions regarding Educational Films.
Advisory Committee on Wild Life.
Scientific Committee of the Institute of Jamaica.
Model Housing Committee of Jamaica Welfare.

Lectures and demonstrations have been given both on entomological problems and on matters interesting building industry.

Plant Inspection Service.

These duties were taken over from Mr. E. D. H. Weller by Mr. Z. A. Daniels, Technical Assistant in the Pl Pathology Division on April 15.

3,781 packages of fruits and vegetables were passed for consumption.
21,006 packages (mainly fruit) were passed for transhipment.
2,100 crates grapefruit from British Honduras were landed in the island and transhipped to Englar
Of imported plants inspected, 83 packages were passed, 15 were destroyed and 5 transhipped.
7,817 barrels of Seed Potatoes from Canada were inspected.
38 Health Certificates were issued.

W. H. Edwards,
Government Entomologist.

(xiv) *Report of Agricultural Chemist.*

)r. H. F. Birch was appointed Assistant Agricultural Chemist as from the 7th February, 1941.

1. Summary of Laboratory Analyses.

Soils	1,300
Limes & Limestones	79
Manures	28
Irrigation waters	24
Brine	5
Grasses	10
Bordeaux mixtures	80
Perenox	4
Miscellaneous	10
	1,540

2. Soils.

Soil work was mainly advisory, involving the following main soil types:—

(a) Richmond Beds Soils, mainly in pasture or bananas and generally deficient in available phosphates and highly acidic and eroded.

(b) Soils derived from metamorphosed rocks of the Blue Mountain Series; once cultivated but now reverted rub and bush, or in young forest. The soils are very deficient in available phosphates and are very highly eroded.

(c) Trappean Shales Soils, mainly in bananas, old sugar cane and citrus, and highly deficient in available phates, with high acidities.

(d) Young soils derived from soft coral sands and limestones, of the Turks and Caicos Islands, extremely alkaline, deficient in available potash. The soils are characterised by surface accumulations of wind borne salt. The accumulations are attaining a dangerously high concentration.

(e) Miscellaneous samples analysed for the Food Production Board and representative mainly, of terra rossa and degradations of this soil type. The soils were usually deficient in available phosphates and potash, being esentative of second rate lands only.

3. Food Crops and Allied Investigations.

The introduction, selection and multiplication of the more promising varieties of food crops has been continued ollows:—

Table I.

	1938.		1939.		1940.		
ed Groups.	Local.	Overseas.	Local.	Overseas.	Local.	Overseas.	Total.
s & Beans	103	173	18	34	2	60	390
es	2	18	2	10	..	15	47
izes	9	24	..	7	..	7	47
ghums	..	14	..	8	..	8	30
cellaneous conomic Crops	1	20	10	11	2	42	86
Total	115	249	30	70	4	132	600

New varieties of fodder crops have also been imported and grown in observation plots.

By the co-operation of planters the number of manurial experiments with food crops has been considerably ended as is shown in the following table.

Table II.

	Maize.	Ground nuts.	Red Peas.	Soya Beans.	Cow Peas.	Irish Potatoes.	Edua Peas.	Sweet Potatoes.	Ginger	Tomatoes	Total.
38	2	2	1	1	1	1	0	0	0	0	8
39	4	4	2	2	1	0	1	1	0	0	15
40	25	3	4	2	2	3	2	2	2	1	46
tal	31	9	7	5	4	4	3	3	2	1	69

The results demonstrate clearly the necessity for applying manures—potash, to terra rossa soils and phosates to Inland Basin soils, the beneficial residual effects of manures and the great necessity for the closer spacing maize.

4. Field Crops.

(a) *Sugar Cane.*—A survey of the yields of sugar cane for the Island, with special reference to soil types, ecological conditions and varieties was made for the 1938-39 crop. The outstanding feature of the survey is the adverse fect of the storms of November, 1939, upon tonnage and purities of cane.

Weekly factory reports were collected from all factories, summarised and circulated to factories. The mean ctory figures for tons cane per ton sugar for the year was 9.72.

The laying out and reaping of experiments with sugar cane were continued and the results published. (new Barbados varieties, B.3439 shows promise. Eleven new variety trials have been laid down during e based upon the recommendations of the Director of the West Indies Sugar Cane Breeding Station, Barba s visited the Island.

A Varieties Committee of the Jamaican Association of Sugar Technologists has been formed.

(b) *Citrus.*—The data from these citrus experiments have been summarised and analysed serially.

On acid Inland Basin soils there is definite evidence that at the present stage of the experiment ($1\frac{1}{2}$ years phates and nitrogen are important manures affecting tree growths beneficially, and that phosphates an bring forward the age at which citrus trees bear fruit on this soil type. These manures also increase the nu fruit per tree.

The results from two experiments on *terra rossa* soils have been very significant. Sulphate of Ammo adverse effects on the trees and on fruiting, whereas potash manures are most essential. The part played l phates is not certain.

R. F. Innes,
Acting Agricultural Chem

(xv). *Report of the Botanist.*

During the whole of the period under review the Botanist acted as Plant Pathologist in addition to c out the duties of his substantive position.

Further considerable increases in the activities of the Botanical Division have occurred as a result of ex of the Banana and Maize Breeding programmes. The Seed Maize improvement project (see Ann. Rpt. 19 progressed successfully and advisory work involving plant identifications and advice on weed control, etc., ha continued. Further experimental work on the control of the pasture weed, Red Tamarind (*Acacia villosa* has had to be postponed owing to lack of staff.

Banana Breeding.

The storm of November, 1939 resulted in a shortage of fruit for pollination until May and some plots did no back into full bearing until July. Seed yields commenced increasing in July and regained normality in A germinations did not reach the usual level until October. In spite of the storm, 7,056 stems were pollinated 1940, an increase of 26% over the previous year, but germinations fell from 1,092 to 720.

No new stations have been established but considerable increases in the acreages of breeding stocks hav made at Florence Hill, Coleraine and Potosi. Climatic conditions were drier and less favourable for setting than in the previous year; the percentage of fertile stems reaped fell from 35% to 21% and the seed yiel 7,000 in 1939 to 2,283 in 1940.

F1 Families.—The principal primary crosses in operation last year (see Ann. Rpt. 1939) have been cont

F2 Families.—F2 crosses, crosses between F1 seedlings, have again been increased, from 2,176 stems poll in 1939 to 4,378 in 1940. Many of the more recent seedlings are now in use.

F3 Families.—(F2 x F2 and F2 x F1). A small number of pollinations between more recent seedlings been undertaken in an attempt to combine favourable commercial characteristics. These crosses will be ext as more material becomes available.

New Seedlings.—Of the 720 seedlings raised, 411 are derived from Gros Michel and related varieties crosse various immune wild (diploid) parents, 3 are backcrosses, 395 are F2's and 1 an F3 seedling. 138 died in th boxes and 185 high polyploids will be discarded.

544 seedlings have been established in the field and the first fruit of 274 new seedlings reaped. Of th possess distinctly promising features from the commercial standpoint and with some 10 others have been se for further trial.

Introductions.—One consignment of seed of a wild banana from Assam labelled 'Wild Red Plaintain received. Germination was poor and only two young plants survive. Seed of *Musa Peckeelii* received from Guinea at the end of 1939 failed to germinate.

Variety Trials.—The two randomised plot seedling variety trials in St. Mary and Vere have grown wel reaping of the first crop was nearing completion at the end of the year.

Further small additions have been made to nursery plots at Hope. A three acre seedling multiplication has been established at Grove in St. Catherine and three more acres were added to the Panama Disease resis test plots in St. Mary. This year, 229 seedlings have been planted out in these plots and 65 seedlings, incl 6 doubtful cases have developed disease.

Maize Improvement.

The original planting of corn in connection with the seed improvement campaign was reaped in March, Yields were poor as a result of drought, storm damage and insect attack. The original plots, at Hope and in were replanted in the Spring and, in addition, selection plots were planted at Retreat near Brown's Town, a typical corn area. The plots included 8 acres of ear row selection plantings, variety trials at Retreat and Ve test various imported strains, several small isolated plots of imported varieties under observation and multiplica and an inbreeding plot at Hope. Growth and yields were good and careful selection provided a nucleus of yellow hulled seed for further work. Similar Autumn plantings were made in the areas on a more extensive and reaping of these was commenced in February 1941. Owing to a wet harvest in St. Ann there was some though not serious, from ear rots and weevil infestation.

Good progress has been made in the selection of a yellow hulled strain for grinding, and milling tests show the selected strain will produce a good meal. This strain is being bulked and sufficient quantities should be a able for limited distribution at the end of 1941. Meanwhile further improvement will be carried on by conti selection.

Preliminary inbreeding work has indicated that owing to the rapid loss of vigour of inbred strains a very l number of inbred lines would have to be carried to ensure a sufficient survival to supply enough lines for cros in the fifth and later generations.

Variety trials indicate that varieties so far imported from other corn growing countries are, with rare excepti quite unadapted to local conditions and incapable of giving good yields in Jamaica. Even varieties from sim climates, e.g. Haiti and Mauritius, were comparative failures.

Diseases and Pests.—No serious epidemic diseases have appeared and diseases observed are noted in the Re of the Plant Pathologist. Considerable losses have resulted from ants and mice in the seed beds, *Laphygma fr perda* on the growing plants and praedial larceny at harvest. Weevils, pentatomids and ear worm have occasion been troublesome. *Laphygma* is the most serious pest especially in the dry areas but is now being successfully c trolled by frequent spraying with a lead arsenate—nicotine mixture.

Miscellaneous.

he Botanist acted as Secretary to the Advisory Committee of the Banana and Citrus Industries, two meetings eld, on July 7th and December 5th.

ctures were given on various aspects of the work of the Botanical and Plant Pathological Divisions and aneous articles were published in the Journal of the Jamaica Agricultural Society on agricultural matters of t interest.

he sincere thanks of the Department are due to the owners, executives and staffs of estates who have so willingly rated and without whose assistance the work of this Division could not have been carried on; in particular ssrs. Agualta Vale, Ltd., Hawkins & Scott, P. Junor, Esq., P. Lindo Esq., New Yarmouth Estates, Ltd., Potosi ., Ltd., and the United Fruit Company.

L. N. H. Larter,
Government Botanist.
7.7.41.

(xvi) *Report of the Plant Pathologist.*

During the period under review, April, 1940 to March, 1941, the work of this Division has been under the control Botanist and Entomologist. The Botanist was responsible for dealing with all diseases other than those of and Sugar Cane and Banana Leaf Spot (*Cercospora musae*) which are reported on elsewhere.

Bananas.

Panama Disease (*Fusarium oxysporum cubense* Schl.) still continues its steady encroachment into banana vations. The number of cases treated amounted to 781,077, new cases recorded to 1,210, and recurrences, cases eviously affected fields, to 719,921. These figures show an apparent but unreal decrease in the disease since ear, accounted for by the abandonment of treatment over considerable areas where the disease has now passed id a controllable stage. The rate of increase of the disease continues to be highest in the parishes with lowest infection, St. Ann, Trelawny, Westmoreland and St. Elizabeth.

None of the alleged cures of Panama Disease reported to the Department and tested during the last few years proved in any degree effective. Experiments under the control of the Senior Agricultural Officer have clearly nstrated that hypodermic injection of potassium permanganate solution is of no benefit in the control of ma Disease.

Occasional cases of bacterial heart rot have been observed but this disease shows no evidence of becoming serious.

A localised outbreak of fruit stalk rot (navel rot) occurred in several parts of St. Thomas in September. This ple does not appear to have been recorded previously. The disease took the form of a progressive rot of the stalk commencing in the interior of the terminal inflorescence bud (the navel) and progressing back along the uncle until in some cases it reached the fruit. Plants were usually affected when the fruit was from half to three-ters full and the conditions caused a cessation of the filling out of the fruit followed by premature ripening, ng and fall of the fingers. No primary pathogenic organism was associated with the disease which did not ear to be infectious. The disease was possibly due to an abnormal succession of soil moisture conditions. As ecautionary measure removal of the navels when fruit was half mature was advised and the disease had tically disappeared by January.

Coconut.

Cocos nucifera L.—Bronze Leaf Wilt has remained confined to the northwest parishses where, except on a few perties, it has largely destroyed coconut cultivations. Its rate of spread has decreased considerably and it has not nded into the adjoining parishes of Trelawny and Westmoreland.

A slight outbreak of bud rot (*Phytophthora palmivora* Butl.) occured in St. Thomas; it was most serious on trees haged by the winds of November, 1939.

Other diseases recorded included Leaf Blight (*Pestalozzia palmarum* Cke.), Wilt (physiological). Bitten Leaf ease (*Diplodia epicocos* Cke. and *Phytophthora* sp.), and Bleeding Stem disease (*Thielaviopsis paradoxa* V.H.).

A report on diseases of this crop in Jamaica was published as a Departmental Bulletin following a visit of Mr. n of the Department of Agriculture, Trinidad.

Pimento.

Pimenta officinalis Lindl.—Pimento Rust (*Puccinia psidii* Wint.) continues to be the limiting factor with this duct. The disease was serious in 1940 but there is promise of a larger crop in 1941.

Mango.

Mangifera indica L.—As usual, Blossom Blight (*Oidium mangiferae*) was reported from a number of holdings ly in 1941, and where control measures have been neglected will be responsible for some fruit loss. No further uble has been caused by *Pestalozzia funerea* Desm.

Potato.

Solanum tuberosum L.—Early and late Blights (*Phytophthora infestans* DeB. and *Alternaria solani* J & Gr.) the st serious diseases of this crop continue to respond satisfactorily to control by spraying Wilt (*Fusarium oxys-rum* Schl.) was unusually prevalent during 1940 and was particularly serious in a number of localities on Up-to-te affected by virus diseases. Other diseases affecting this crop include Collar and Tuber Rot (*Rosellinia* spp.), uber rot (*Fusarium* (?) *oxysporum* Schl.), mosaic and other virus diseases.

Ground Nut.

Arachis hypogea L.—With the increased production of this crop the disease situation has become more serious d in particular Root Rot (*Sclerotium Rolfsii* Sacc.) has been frequently reported and caused considerable losses. ust (*Puccinia arachidis* Speg.) is widespread but rarely severe enough to cause serious damage. Wilt (*Fusarium* .) shows signs of becoming increasingly troublesome. Other diseases noticed included Damping Off (?*Phoma* .), Leaf Blight (*Gloeosporium* sp.), and Leaf Spot (*Cercospora personata* Ell.)

Cassava.

Manihot utilissima Pohl.—Isolated outbreaks of Leaf Spot (*Cercospora Henningsii* All.) were few though s following the autumn rains. Spraying was recommended and the condition was cleared up.

Other diseases reported and investigated included:—

Avocado (*Persea americana* Mill.) affected by Die Back—*Colletotrichum gloeosporioides* Penz.
Coffee (*Coffea arabica*) affected by Leaf Spot—*Cercospora coffeicola* B and C.
Ginger (*Zingiber officinale* Rosc.) affected by Black Rot—*Rosellinia bunodes* Sax.
Grape (*Vitis vinifera* L.) affected by Mildew—*Uncinula necator* Burr.
Papaw (*Carica papaya* L.) affected by Mosaic—Virus
Tobacco (*Nicotiana tabacum* L.) affected by Mosaic—Virus
" " affected by Green Mould—*Penicillium* spp.
Maize (*Zea Mays* L.) affected by Foot rot—?Bacterial.
" " affected by Heart rot—?Bacterial
" " affected by Smut—*Ustilago zeae* Ung.
" " Rust—*Puccinia sorghi* Schw.
" " affected by Leaf Spot—*Diplodia macrosporus* Ea.
" " affected by Leaf Spot—*Cercospora sorghi* E and E.
" " affected by Leaf Stripe—*Helminthosporium* (?) *turcicum* Pass.
" " affected by Mosaic—Virus
" " Stem Rot—*Diplodia zeae* Lev.
" " affected by Ear Rot—*Diplodia zeae* Lev. & *Fusarium* spp.
Guinea Corn (*Sorghum vulgare* Pers.) affected by Smut—*Sphacelotheca sorghi* Cl.
Rice (*Oryza sativa* L.) affected by Ear Blight—?*Cladosporium* sp.
Sesame (*Sesamum orientale* L.) affected by Foot Rot—?*Macrophomina phaseoli*
Soy Bean (*Glycine max* Merr.) affected by Mosaic—Virus
Red Pea (*Phaseolus vulgaris* L.) affected by Mosaic—Virus
" " affected by Rust—*Uromyces appendiculatus* Lev.
" " affected by Mildew—*Erysiphe polygoni* D.C.
Pigeon Pea (*Cajanus cajan* Millsp.) affected by Wilt.—*Fusarium* sp.
Cow Pea (*Vigna unginculata* Walp.) affected by Leaf Spot—*Cercospora* sp.
Artichoke (*Helianthus tuberosus* L.) affected by Storage Rot—*Rosellinia pepo* Pat. *Fusarium* sp.
Cabbage (*Brassica oleracea* L.) affected by Leaf Spot—*Alternaria brassicae* Sacc.
" " " " Black Rot—*Pseudomonas campestris* E. F. Sm.
Onion (*Allium cepa* L.) affected by Leaf Spot—*Macrosporium commune* Rab.
Tomato (*Lycopersicum esculentum* Mill.) affected by Fruit Rot—*Fusarium* spp. *Colletotrichum pomou* Ches.
" " " affected by Wilt—*Fusarium* sp.
" " " affected by Leaf Mould—*Cladosporium fulvum* Cke.
Turnip (*Brassica Rapa* L.) affected by Rot—Bacterial (?B. *caratovorus* J.)
" " " affected by Mosaic—Virus
" " " affected by Leaf Spot—*Macrosporium* sp.
Aster (*Callistephus chinensis*) affected by Wilt—*Fusarium* sp.
Poinsettia (*Euphorbia pulcherrima*) affected by Canker—*Colletotrichum* sp.
Sunflower (*Helianthus annuus* L.) affected by Rust—*Puccinia helianthi.*

Of the above diseases, *Cercospora* Leaf Spot and *Fusarium* Wilt of Groundnut, Sunflower Rust, Bacterial Hea Rot of Maize and *Diplodia macrospora* on Maize do not appear to have been previously recorded in this country.

L. N. H. Larter,
Acting Plant Pathologist.
7.7.41.

(xvii) *Report of the Leaf Spot Control Officer.*

The intensity of Leaf Spot incidence has been subject to the usual seasonal fluctuations. The effect of rain which tended to increase infection and to interfere with spraying was such that control was difficult in certain section of the Island and particularly in the Western Division.

The appearance of the bananas throughout the Island was severely affected by high winds and low temperature towards the end of 1940. In sections of St. Mary and St. Catherine, adverse weather conditions and lack of attentio to banana cultivation were of greater importance in the growth of the bananas than Leaf Spot Disease. Fruit o good quality is still being produced without Leaf Spot control measures in the eastern parishes although the averag intensity of infection in that region has generally increased.

Supervision of Spraying.

It was found desirable that all cultivation be inspected by Government Officers before equipment for spraying was issued. These inspections were undertaken by officers of the Division and by Plant Disease Inspectors. The total number of inspections made during the year is 2,101. The total number of growers spraying regularly as far as can be estimated is about 900. The cultivations of all growers who have received issues of equipment are visited by Officers of the Company to whom they are contracted who are responsible for the supervision of their spraying. The total number of advisory visits made during the year is 6,467.

Routine inspection of the thirty Depots maintained by the Board for distribution of materials have been performed by Officers of the Division.

Investigational Work.

Two properties have been acquired for undertaking field experiments with bananas. One is situated in the centre of a banana area in the parish of St. James and the other in the centre of the banana area in the parish of St. Mary. Each is representative of surrounding areas. Both properties have required a considerable amount of conditioning before they could be used for experimental purposes, and planting out will take place in April and May of 1941.

he general lines of investigation are based on the assumption that if the banana crop is to bear the additional f spraying, the production per acre will have to be increased. It is proposed to lay down experiments with bject in view, using fertilizers to enable a greater population of plants per acre to be produced while still main- g satisfactory fruit quality, and to increase the rate and growth, using mulch to overcome the periods of slow h induced by periods of drought evolving soil conservation methods to maintain the fertility and to increase the mity of production throughout hillside banana fields. Experiments are also being conducted on soils which t considered to be normal banana soils with a view to developing methods of banana cultivation on these soils. experiments along these lines are already in progress.

Miscellaneous.

wing to war conditions, the staff of the Division has undertaken numerous other duties mainly in connection Food Production.

H. H. Croucher,
Leaf Spot Control Officer.

(xviii) *Report of the Leaf Spot Mycologist.*

A study of the etiology of *Cercospora musae* was made during the year in order that a sound basis might be found by improved methods of control.

Since experiments with artificial infections carried out in other countries had not clarified the problem of the on of infection, an extensive examination of natural infection was made by using a method of direct observation pores germinating on the surface of banana leaves.

Evidence has been obtained indicating that heavy infection occurs, for the most part, on the lower surface of oping heart leaves under Jamaican conditions. Another type of infection is known to occur in the form of modic heavy infection of older leaves which must be considered of a secondary nature. This type of infection, nately uncommon, can cause sudden marked increases in the intensity of leaf spot in plantations relatively of the disease.

Present spraying methods are considered to attain control (a) by reducing sporulation of the fungus on sprayed spots and (b) by rendering the dew toxic to any spores which may be produced on sprayed leaves because in three ur weekly spraying cycles many heart leaves are not sprayed and little spray material adheres to the surface nch young leaves.

Evidence in favour of this view was obtained by effecting control by spraying all leaves except those considered susceptible to infection.

Interesting results were obtained in comparative tests with Bordeaux mixture and Perenox (fungicides in use er the direction of the Banana Leaf Spot Control Board). They have been found to react differently in regard heir effect on sporulation and dew toxicity. Bordeaux supresses sporulation of *Cercospora* far more effectively Perenox while, vice-versa, dew taken from Perenox sprayed leaves is markedly more toxic to spore germination dew from Bordeaux sprayed leaves.

Shade can effect a natural control of leaf spot by preventing the formation of dew which is the main source of moisture necessary for sporulation of *C. musae*. Similarly absence of dew reduces infection by preventing the nination of the spores on the surface of susceptible leaves.

The perfect stage of *C. musae* has been established and has been named *Mycosphaerella musicola*. A description his ascomycete has been published—'Banana Leaf Spot, *Mycosphaerella musicola* the perfect stage of *Cercospora ae* Zimm.' Tropical Agriculture Vol. XVIII, p. 91.1941.

Preliminary experiments with heart-leaf spraying, using a spray with a high wetter content, have given a arkably high standard of control and may form a basis for improved methods of spraying especially for the small wers who are somewhat reluctant to undertake the present methods of spraying.

R. Leach,
Leaf Spot Mycologist.

D. Forestry.

(xix) *Report of Conservator of Forests.*

1. Forest Area.

Forest Area.—The forest area of the Island as at March 31st, 1941 is estimated as follows:—

	Acres.	
Forest Reserve	209,209	(increase 8,210 acres)
Unreserved Crown Lands	40,000	
Private Forests	200,000	
	449,209	

2. Forest Reservation and Demarcation.

Gazetting of Reserves.—An area or 1,772 acres of purchased land was gazetted as Forest Reserve (Jamaica Gazette April 4th, 1940) while minor amendments in the gazetting of other areas were made.

Land Settlement.—Reserves on Land Settlements totalling 4,294 acres were approved and taken over by the partment during the year. The Lands Department will be reimbursed for these lands when conditions return normal, while in some instances the Water Commission will also contribute.

Acquisition.—Approval for the purchase of 2,428 acres of steep mountain land in the Blue Mountains was secured t only 180 acres were finally purchased; in the case of the remainder surveys were completed, and the conveyances re in course of preparation at the end of the year.

Water Commission.—The purchase of lands in the Kingston catchment by the Water Commission was continued t figures are not yet available.

Demarcation of boundaries.—The Forest Settlement Officer devoted much time to the final selection and cation of the northern boundary of the Blue Mountain Reserve. This included chain and compass survey total length of new boundary demarcated amounted to 12½ miles, while 21 miles of old boundary was Examination and provisional settlement of many miles of other Reserve boundaries were carried out.

3. Surveys.

Forest Surveys.—A surveyor continued to work on Forest surveys under the direction of the Director of S mainly in the survey of areas being purchased. A total of 46½ miles of survey was completed.

4. Maintenance of Forest Reserves.

Forest Trails.—The length of forest trails (4′ and 6′) maintained by the Division amounted to 47 miles 26 on April 1st, 1940; during the year 4 miles 21 chains of new trail were constructed in the Blue Mountains necessary maintenance work was undertaken.

Crown Lands Roads.—In conjunction with the above, the Division undertook the location and construc nearly 5 miles of bridle road in the Blue Mountains on behalf of the Lands Department.

Buildings.—A new Ranger's quarters was constructed at Wait-a-bit and a combined garage, storeroo picnic shelter at Hardware Gap. The log cabin at Portland Gap and the Ranger's quarters at Hermitag completed.

Forest Offences.—Forest offences totalled 135 (121 in 1939-40) of which 47 were for larceny of timber, encroachment on Reserves and 27 for cattle trespass.

Fires.—The number of fires on Crown Lands and Forest Reserves was 13, covering 115 acres, of which o is estimated to have burnt 100 acres. These fires were all in grassland or second growth and no economic tree lost. No fires were reported from protected catchment areas.

5. Afforestation.

Nurseries.—In all 12 nurseries were maintained; 535 quarts of seed were collected and 57,000 plants rem Apart from plants used in departmental operations 10,000 young trees were distributed to other Government D ments and private individuals.

Afforestation.—Progress was made in afforestation of grassy and bracken-covered hillsides in the Blue Mou Forest Reserve, the principal species used being Mahoe (*Hibiscus elatus*), Cedar (*Cedrela odorata*), Mahogany *tenia mahagoni*), Cape Yacca (*Podocarpus elongatus*) and Juniper Cedar (*Juniperus lucayana*). Activities continued at Green Hills, Hermitage and Shooters Hill and 47,000 trees were planted. Direct sowing of se *Pinus Massoniana* failed due to bad seed. Soil analyses of Hollywell where practically all species failed, rev a nearly complete absence of phosphates and it is proposed to plant only Pine with a low nutrient demand. short Borer of Cedar (*Hypsipylla grandella*) was observed on the plantations for the first time.

Rainfall during the year was adequate and well distributed and resulted in much improved surv val rates best since the Division was started). The use of larger planting stock (for Cedar, Mahoe and Mahogany 2′–3′ and complete defoliation prior to planting has also improved survival.

Complete survey of all planting areas was not finished by the end of the year and it is not possible to acreages; revised figures will be given in the next report.

6. Utilisation.

Licences.—During the year 200 new licences were issued and 60 old licences extended; the outturn of timber fuel from Forest Reserves amount to 46,518 cu. ft. There is a slight decrease in outturn of timber due to more rules to prevent wastage in the cutting of railway sleepers; this has resulted in less 8′ x 6″ x 8″ sleepers being from Crown Lands, thus releasing trees for less wasteful conversion in the future.

Imports and Exports.—Figures regarding the imports and exports of forest produce are given in Append The importation of Pitch Pine from the United States of America was controlled by quota and there was incre importation of Douglas Fir from Canada.

Timber Depot.—As a result of recommendations of the Division, the Government authorised the establishi of a timber depot to be run by the Marketing Department. This has been begun and handsawn native timb being purchased, stacked, seasoned, graded and will be retailed.

Investigations.—Small quantities of handsawn native lumber were stacked for seasoning and for preparatio samples at the Hope seasoning shed. Simple wood-working equipment was purchased for the workshop. A s ment of logs of 6 native species was made to the U.S.A. through a local firm, for box and crate making trials.

A bamboo survey of the Island was made in collaboration with other departments in connection with pos paper pulp production and a trial shipment of ½ ton of bamboo was sent to England.

A preliminary survey of native timbers was completed and the data tabulated in a bulletin which was in press at the end of the year.

7. Finance.

The total expenditure of the Division amounted to £6,087; in addition the salary and expenses of 8 Fo Rangers and of the Forest Surveyor were borne by the Lands and Survey Departments respectively. Reve amounted to £1,054 of which £200 was contributed by the Water Commission towards re-afforestation costs in Kingston catchments.

8. Administration.

District Organisation.—A great part of the time of the Staff was devoted to re-organisation of districts, preparation of district maps, the investigation of squatters, tenants and purchasers within Forest Reserves general improvement of the chaotic state of many of these areas.

Staff.—One Forest Ranger was dismissed, one resigned and two new Rangers were appointed.

Sixteen Government Officers were gazetted Forest Officers and the appointment of 10 others was cancel

A week's instructional course at the Jamaica School of Agriculture was arranged and attended by 22 Fo Rangers.

Four part-time Forest Headmen were appointed in districts unsuitable for whole-time Rangers, while Overs of Land Settlements act as Forest Headmen on any Reserves on their settlements.

Approximately £1,400 was expended on labour; average employment was 4 days per week and average pay 3/- per day, equivalent to a permanent labour force of 47.

9. General.

il Conservation..—Progress has been made in stimulating interest in erosion control, by means of broadcasts, s, articles and demonstrations. Assistance has been given in the layout of control measures on areas operated Lands Department, Food Production Board and Department of Agriculture. A simple contouring level signed and a number are now in use. A scenario for a local "Soil Conservation" film was submitted and ed and the shooting of the film has been begun.

ecreational use of Forest Reserves.—The Government has approved in principle of the policy of permitting tional use of Forest Reserves and large numbers of people have availed themselves of the trails and huts main- by the Division in the Blue Mountains. Assistance has been given in the formation of Hiking Clubs.

ommittees.—The following problems have been investigated in connection with Committees on which the rvator of Forests served; rehabilitation of flood sufferers in Portland, land use in the Blue Mountains, tree- ng projects of 4-H Clubs, local timbers for model homes, grading and storage of imported lumber, organisation ber depots, wild life conservation, displays of forest produce in the Museum of the Institute of Jamaica; in cases very satisfactory progress has been made.

liscellaneous.—A survey was begun of rural water supplies in relation to the vegetative state of the catchments a view to collaboration with Parochial Boards in protective measures.

nti-malarial work was completed in the Rockfort Reserve to the satisfaction of the Health Authorities.

chemes to relieve unemployment by forest and soil conservation works on the lines of the C.C.C. Movement investigated and submitted.

n aboretum was begun at Hope Gardens.

he Conservator of Forests visited British Honduras to study silvicultural and utilisation problems.

cknowledgments.—Close co-operation has been maintained with the Lands Department, Survey Department amaica Agricultural Society; to these, to other officers of the Department of Agriculture and to the Crown tor we are much indebted.

would like to record my appreciation of the extremely good work done by the staff of the Forestry Division g the year.

C. Swabey,
Conservator of Forests.

Appendix 1.

Progress in Forest Reservation and Demarcation.

Map No.	Name of Reserve.	Reserves approved but not finally constituted.			Reserves constituted but not finally demarcated.				Reserves constituted and demarcated.				Grand Total.
		On April 1, 1940	Added during year	On March 31, 1941	On April 1, 1940	Added during year	Transferred	On March 31, 1941	On April 1, 1940	Added	Excluded	On March 31, 1941	March 31, 1941
	Protection Reserves:												
2	Dolphin Head	..	..	..	300	..	..	300	..	..	..	..	300
3	Burnt Savanna	..	..	..	..	..	..	..	97	1	..	98	98
9	Bull Head	..	..	..	769	..	..	769	..	..	..	..	769
10	Kellets	..	..	..	1,500	..	1,500	..	..	1,309	..	1,309	1,309
21	Charlton	..	..	..	..	..	..	..	150	6	..	156	156
32	Blue Mountains	..	4,827	4,827	84,294	1,772	..	86,066	..	..	..	..	90,893
33	Haycock Hill	..	..	..	600	..	..	600	..	..	..	..	600
34	Petersville	..	422	422	..	..	..	..	..	..	..	..	422
35	Belfont	..	154	154	..	..	..	..	..	..	..	..	154
39	New Forest	..	397	397	..	..	..	..	..	..	..	..	397
41	Greenock	..	122	122	..	..	..	..	..	..	..	..	122
45	Fort Stewart	..	195	195	..	..	..	..	..	..	..	..	195
48a & 48b	Chepstowe	..	114	114	..	..	..	..	..	..	..	..	114
52	Platfield A, B, C, D	..	11	11	..	..	..	..	..	..	..	..	11
53	Spring Garden	..	47	47	..	..	..	..	..	..	..	..	47
54	Spring Vale	..	142	142	..	..	..	..	..	..	..	..	142
55 & 56	Middleton Stream A & B	..	58	58	..	..	..	..	..	..	..	..	58
57	Ramble	..	133	133	..	..	..	..	..	..	..	..	133
	Total	..	6,622	6,622	87,463	1,772	1,500	87,735	247	1,316	..	1,563	95,920
	Production Reserves:												
6 & 6a	Cockpit Country	..	..	..	51,000	..	..	51,000	..	..	..	..	51,000
6b	Ruthven	..	..	..	1,300	..	..	1,300	..	..	..	..	1,300
6e	Shuna	..	..	..	1,350	..	..	1,350	..	..	..	..	1,350
6g	Discovery	..	..	..	600	..	..	600	..	..	..	..	600
7	Dry Harbour Mountains, West	..	..	..	12,500	..	..	12,500	..	..	..	..	12,500
8	Dry Harbour Mountains, East	..	..	..	14,200	..	..	14,200	..	..	..	..	14,200
18	Ballintoy	..	..	..	3,000	..	..	3,000	..	..	..	..	3,000
19	Camperdown	..	..	..	1,600	..	..	1,600	..	..	..	..	1,600
20	St. Faith	..	..	..	720	..	..	720	..	..	..	..	720
23	Portland Ridge	..	..	..	7,700	..	..	7,700	..	..	..	..	7,700
25	Healthshire Hills	..	..	..	19,319	..	..	19,319	..	..	..	..	19,319
	Total	..	..	..	113,289	..	..	113,289	..	..	..	..	113,289
	Grand Total	..	6,622	6,622	200,752	1,772	..	..	..	..	..	..	..

Category.	Gross Imports.		Gross *Exports.*		Net Imports or *Exports.*		Average annual net Imports or *Exports* for quinquennium ended 31.12.40.		Percentage value of gross imports or *Exports* from or *to* different sources or *destinations* during the year.
	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	
TIMBER.									
Sawn—									
Douglas Fir	3,849	51,423	2	59	3,847	51,364	1,927	22,900	*Cayman Islands* 63%; *Turks Is.* 37%; Canada 100%.
Pitch Pine	8,510	130,559	117	2,632	8,393	127,927	10,673	122,332	U.S.A. 85%; Bahamas 14%; Santo Domingo 1% *Cayman Islands* 3%; *Turks Island* 97%.
White Pine	138	3,539	1	10	137	3,529	130	2,141	*Turks Islands* 100%; Canada 100%.
Mahogany	..	..	68	27	*68*	*27*			*Cayman Islands* 100%.
Unenumerated	285	8,329	..	81	285	8,248	66	3,050	Br. Guiana 60%; Canada 20%; U.S.A. 11%; Br. Honduras 9%; *Turks Is.* 96%; *U.S.A.* 4%
Logs—									
Ebony	..	..	15	214	*15*	*214*	17	206	*U.K.* 96%; *U.S.A.* 4%.
Lignum Vitae	..	..	86	1,181	*86*	*1,181*	680	1,432	*U.K.* 81%; *U.S.A.* 13%; *Canada* 5%; *Australia* 1%.
Satinwood	..	..	27	320	*27*	*320*	95	197	*U.K.* 100%.
Unenumerated	..	1	..	..	..	1	..	..	Cayman Islands 100%.
Roundwood—									
Piles	..	..	..	..	..	..			
Greenheart	..	1,695	..	..	..	1,695	..	..	Br. Guiana 85%; Trinidad 15%.
Unenumerated	..	444	..	..	..	444	..	..	Br. Guiana 39%; U.S.A. 60%; Cayman 1%.
Total Timber	12,782	195,990	316	4,524	12,466	191,466	13,588	152,258	
WOOD PRODUCTS.									
Shingles—									
Cypress and Wallaba	..	429	..	..	..	429	..	850	U.S.A. 99%; Br. Guiana 1%.
Boston Chips—									
Cedar and Others	..	4,961	..	103	..	4,858	..	3,755	*Turks Is.* 61%; *Cayman* 39%; Canada 85%; U.S.A. 15%.
Matches	..	..	..	208	..	*208*	..	333	*Canada* 62%; *Turks Is.* 14%; *Bermuda* 7%; *Br. Honduras* 17%.
Paper and Pulp Products	..	210,761	..	4,787	..	205,974	..	137,794	Canada 40%; U.K. 40%; U.S.A. 17%; Others 3%; *U.S.A* 60%; *Turks Is.* 30%; *Bahamas* 9%; *Others* 1%.
Other Cellulose Products	..	124,906	..	241	..	124,665	..	127,295	*Bahamas* 43%; *Canada* 40%; *Br. Honduras* 17% U.K. 34%; Canada 24%; U.S.A. 16%; Others 26%.
Furniture	..	10,843	..	615	..	10,228	..	14,982	*U.S.A.* 67%; *Turks Is.* 18%; *Panama* 7%; *Others* 8%; U.S.A. 30%; Canada 58%; Sweden 10%; Others 2%.
Hoops, shooks, staves, etc.	..	76,609	..	..	..	76,609	..	74,898	U.S.A. 55%; Canada 33%; U.K. 10%; Others 2%.
Other wooden ware	..	8,280	..	..	..	8,280	..	..	U.S.A. 60%; Canada 28%; Others 12%.
Total Wood Products	..	436,789	..	5,954	..	430,835	..	359,907	

Imports and *Exports* of Timber and Forest Produce during year ended December 31st, 1940, *contd.*

Category.	Gross Imports.		Gross *Exports.*		Net Imports or *Exports.*		Average annual net Imports or *Exports* for quinquennium ended 31.12.40.		Percentage value of gross imports or *Exports* from or *to* different sources or *destinations* during the year.
	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	Hundreds of cu. ft.	Value in £	
MINOR FOREST PRODUCTS.									
Tan Stuffs and Dye stuffs—									
Divi-divi	..	..	..	110	..	*110*	..	711	*U.K.* 91%; *Br. Honduras* 9%.
Fustic	..	..	..	3,051	..	*3,051*	..	2,771	*U.K.* 31%; *U.S.A.* 6%; *France* 63%.
Logwood	..	..	..	17,175	..	*17,175*	..	26,351	*U.S.A.* 31%; *U.K.* 1%; *France* 68%.
Logwood Extract	..	..	..	79,794	..	*79,794*	..	72,663	*U.K.* 93%; *Switzerland* 4%; *U.S.A.* 1%; *Others* 2%.
Mangrove Bark	..	506	..	..	..	506			Cayman Islands 100%.
Drugs and Spices—									
Cactus	..	..	..	44	..	*44*	..		*U.K.* 9%; *U.S.A.* 91%.
Sarsaparilla	..	..	..	2,620	..	*2,620*	..		*U.K.* 57%; *France* 14%; *Australia* 11%; *Others* 18%.
Dogwood Bark	..	..	..	227	..	*227*	..		*U.K.* 35%; *U.S.A.* 65%;
Bitterwood	..	..	..	1,789	..	*1,789*	..		*Italy* 75%; *France* 12%; *U.S.A.* 10%; *U.K.* 3%.
Quassia Chips	..	..	..	2,092	..	*2,092*	..		*U.S.A.* 79%; *U.K.* 13%; *Canada* 5%; *France* 3%.
Quinine	..	6,800	..	..	..	6,800	..	3,869	U.K. 96%; Holland 3%; U.S.A. 1%.
Incense and Perfume Woods—									
Amyriswood	..	..	..	126	..	*126*	..	..	*U.S.A.* 61%; *U.K.* 39%.
Gums and Resins—									
Gums	..	227	..	..	..	227	..	..	U.K. 50%; French Sudan 25%; Others 25%.
Rosin	..	1,639	..	..	..	1,639	..	..	U.S.A. 99%; U.K. 1%.
Rubber, Raw	..	54	..	..	..	54	..	..	U.K. 100%.
Rubber and Gutta Percha	..	8,953	..	..	..	8,953	..	..	Canada 49%; U.K. 33%; U.S.A. 16%; Others 2%.
Miscellaneous—									
Cork	..	3,384	..	..	..	3,384	..	..	Spain 90%; Portugal 5%; U.K. 3%; Others 2%.
Total Minor Forest Products	..	21,563	..	107,028	..	75,465	..	106,365	
Grand Total	..	654,342	..	117,506	..	536,836	..	618,530	

E. Publications.

The following departmental publications were issued during the year ended 31st March, 1941:
Bulletin No. 22 (New Series)—"Report on the Coconut Growing Areas of Jamaica" by F. M. Bain.
Bulletin No. 23 (New Series)—"A Survey of the Yields of Sugar Cane in Jamaica, 1938-39." Report by R. F. Innes.
Bulletin No. 24 (New Series)—"A Survey of the Yields of Sugar Cane in Jamaica, 1937-38". Report by H. H. Croucher.
Bulletin No. 25 (New Series)—"Reprints of Miscellaneous Articles, 1938."
Bulletin No. 26 (New Series)—"Banana Leaf Spot Investigations: 1. The Basis of Control." By R. Leach.
Bulletin No. 27 (New Series)—"Reprints of Miscellaneous Articles, 1939."
Annual Report for the Period 1st January, 1939 to 31st March, 1940.

SECTION III.—LEGISLATION.

Legislation Affecting Agricultural Industries.

A. *Laws relating to Agriculture passed during the year,* 1940.

	Date Assented to.	Short Title.	Chief Provisions.
	24th April, 1940 ..	The Agricultural Loans (Amendment) Law, 1940	Amending the principal Law by exempting from stamp duty and fee the recording of Agreements between the borrower and an Agricultural Loan Society.
	24th April, 1940 ..	The Agricultural Societies (Special Loans) (Amendment) Law.	Providing for minor amendments to the principal Law
1	24th April, 1940 ..	The Agricultural Loan Societies (Amendment) Law, 1940	Providing for minor amendments to the principal Law.
2	2nd July, 1940 ..	The Rum Control (Amendment) Law, 1940	Providing for the granting by the Governor of special licences for the manufacture of rum on application signed by a majority of at least two-thirds of the total number of sugar factory owners.
6	26th July, 1940	The Rum Duty (Amendment) Law, 1940	Increasing the Excise Duty on rum from ten shillings and eight pence to twelve shillings per gallon.
4	26th July, 1940 ..	The Tariff (Amendment) (Fresh Milk) Law, 1940.	Exempting from duty fresh milk imported into the Island by a condensery for manufacture into condensed milk.
5	26th July, 1940 ..	The Condensed Milk (Excise Duty) Law, 1940.	Imposing an Excise Duty of three shillings and sixpence on every hundred pounds weight of condensed milk manufactured in the Island.

B.—Orders, Regulations, Proclamations, etc.

Date.	Jamaica Gazette.	Description.	Subject.
18.1.1940	25.1.1940	Regulations under the Coconut Oil products (Excise Duty) Law, 1939.	Prescribing the books, forms and records to be for the purposes of the Law.
16.2.1940	29.2.1940 ..	Regulations under The Sugar Industry Control Law, Cap. 302.	Requiring sugar manufacturers to whom lic have been granted to accept all canes deli by a cane farmer registered at the factory n in the licence if the canes are in order.
11.3.1940	14.3.1940	Order under the Safeguarding of Local Industries Law, Cap. 298	Adding Powdered and Skimmed Milk to the Schedule of the Law.
16.3.1940	21.3.1940	Regulations under the Safeguarding of Local Industries Law, Cap. 298.	Prescribing the conditions of Licence to be gra for the manufacture of condensed milk and for the establishment of a condensed milk factor
11.3.1940	21.3.1940	Regulations under the Agricultural Produce Law, Cap. 339.	Rescinding Sections 1, 2, 3 of the Regulations m on 14.9.37 and substituting therefor new reg tions making the Marketing Department responsible authority and the Marketing Trade Commissioner the responsible officer.
21.5.1940	30.5.1940	Order under the Safeguarding of Local Industries Law, Cap. 298.	Adding Coconut to the First Schedule of the L
24.6.1940	11.7.1940	Regulations under the Sugar Industry Control Law, Cap. 302	Amending previous Regulations to provide for registration and testing of all scales used for purchase of cane.
6.8.1940	15.8.1940	Order under the Bees Importation Protection and Transportation Law, Cap. 345	Prescribing measures to be taken for the treatm of any disease of Bees by owners or persons hav the charge or management of Apiaries in t Island.
11.11.1940	21.11.1940 ..	Order under the Contagious Diseases of Animals (Inland) Law, Cap. 80.	Prohibiting the landing of all animals brought fr the Turks and Caicos Islands.
11.11.1940	21.11.1940	Order under the Contagious Diseases of Animals (Inland) Law, Cap. 80.	Prohibiting the landing of all animals from t Cayman Islands except under specified condition
25.11.1940	28.11.1940	Proclamation under the Customs (Importation Prohibition) Law, Cap. 176.	Permitting the importation into Jamaica of citr fruit from British Honduras for the purpose transhipment subject to compliance with specifie conditions.
19.11.1940	28.11.1940	Regulations under the Minimum Wage Law, 1938. (Law 31 of 1938).	Providing for the establishment of an Advisor Board for the Sugar Industry.

Appendix 1.—Food Production.

Report of the Live Stock Officer.

The programme of the Live Stock Division which was organized in September, 1939, was carried out as planned. The main object of the Division is to increase in numbers and improve in type all classes of live stock raised in the Island. Attention to the question of improved fodder and pasture conditions as well as disease control was also given.

Live Stock Improvement Centres.—A total of 41 Live Stock Improvement Centres were in operation during the year, 29 being under the Food Production Board, 5 under Jamaica Milk Products, Ltd., and 7 under the Dairy Extension Service.

Services for the year totalled 8,058 which number was made up as follows: Bulls, 2,484; Rams (goats), 4,559; Boars, 966; Ram (sheep), 116; and Jacks, 113.

Imported Sires.—The sires imported which included dairy bulls, pigs and milk goats, have done well. One Guernsey bull died of Tick Fever out of the 17 bulls imported.

Pasture and Fodder Crop Trials.—Some 90 varieties of pasture and fodder crops have been tested. Several grasses show distinct promise of becoming well established in Jamaica and replacing some of the existing grasses. The more promising varieties are now being tested under field conditions and as they prove satisfactory, planting material will be distributed to the various areas. Chemical analysis of the more important varieties has been made.

Meat Curing Experiment.—In collaboration with the Marketing Department, the Live Stock Division assisted in a bacon curing experiment.

Condensery.—The establishment of the Condensery at Bog Walk by the Jamaica Milk Products, Ltd., has done much to increase the interest in dairying throughout the Island, and the demand for dairy cattle at the present time is far in excess of the supply.

Dairy milk receipts at the Condensery are at present approximately 10,000 quarts.

General Extension Work.—The Live Stock Field Officers in co-operation with the Agricultural Instructors and Plant Disease Inspectors, addressed a number of Meetings in the country and gave demonstrations on various phases of live stock work. I wish to express my appreciation for the co-operation and assistance rendered by the various organizations interested in agriculture in the Island.

J. W. Howe,
Live Stock Officer.

Appendix 2.—Agriculture in the Turks and Caicos Islands.

Report of the Agricultural Officer.

1. Introductory Remarks.

Soil Conditions.—There are three main soil types:

(1) Black Loam.
(2) Red Loam.
(3) White sand.

They are all derived from limestone either coral or soft white limestone. The soils contain large amounts of free calcium carbonate and are highly alkaline in reaction. The humus content is very high and most of the soils are extremely rich in nitrogen. The available potash figures indicate considerable variation and it is expected that some of the Black Loam soils will respond to applications of potassic manure. Although analyses show a high phosphate content, the purpling of the hypocotyls of tomato seedlings grown in both the black and red types show that the high calcium content has caused the phosphate to be fixed as an insoluble tricalcium phosphate. The high available nutrient figures indicate that the soils suffer from sodium chloride contamination and in several of the samples analysed the soils were found to be reaching a critical stage in their sodium chloride concentration.

Rainfall.—From 12th August, 1940, rainfall records were commenced at Kew, Blue Hills and Lorimers and records of temperature and humidity were kept at Kew. From 12th August, 1940 to 31st March, 1941, 40.76 inches of rain fell at Kew.

The distribution of rainfall in the Caicos Islands is most unsatisfactory, the bulk of the rain falling between August and January.

The limiting factors in the agriculture of the Caicos Islands are therefore:

(1) Inadequate soil moisture.
(2) The presence of salts in the soil.

The Native Method of Cultivation.—Preparation of the land consists of cutlassing and burning the bush. Crops are then planted between the numerous rocks and stones that occur in all fields. The same plot of land is used for two or three years after which its productivity becomes so low that the field must be abandoned.

Among the crops grown are Indian corn, Guinea corn, cassava, sweet potatoes, pigeon peas, sesame, tomatoes and cabbages. A severe handicap is the prevalence of praedial larceny.

2. Organization of Work.

Demonstration Plots.—An acre of land was completely cleared of bush and stones and donkey manure, the only abundant manure, was incorporated in the soil. Maize, peanuts, cow peas, cassava, sweet potatoes, yams, carrots and beets were successfully grown. Later the same success was had with onions and soya beans.

Instructions in the Field.—To build up resistance to dry conditions the humic content of the soil must be increased by discontinuing the habit of burning the vegetation when clearing the land and by adding as much farmyard manure and vegetable matter as possible.

To allow proper cultivation it is necessary that the stones should be placed in rows along the contours to check the erosion that accompanies the wet season.

There are several sour orange trees occurring in the Islands and the Agricultural Officer is top-working these trees with grapefruit and selected oranges.

3. Plans for Development.

Since it is through the younger generation that improvement in the agricultural conditions of the Islands is expected, school gardens and a small farm for training Caicos youths have been established. In the school gardens the value of fresh vegetables is being stressed and it is hoped that enough vegetable will be grown to make up for the deficiency of this article in the diet of the children and to provide a surplus for export to the salt-producing islands.

On the farm six youths are to be trained each year along the lines used with the agricultural cadets of Dominica. These boys are being trained to care properly for pigs and milch goats.

An experiment has been laid out to compare four methods of cultivation:—

(a) Native Method—Cutlassing and burning bush on land. No stumping.
(b) Cutlassing and removing bush, stumping and removing stones to a depth of about one foot.
(c) Cutlassing and removing bush, stumping and removing only surface stones.
(d) Cutlassing and removing bush (leaving all stones).

The experiment will be continued for at least two years. At the end of the first crop the native method (burni surpassed the others. This was expected on account of:

(1) the potassium added through the ashes of burnt vegetation;
(2) A wet growing season which did not show up the lowered water-retaining capacity consequent on destruction of humus by burning.

In subsequent crops, however, the potassium will have been used up and the loss of humus will be more appar under the dry conditions that usually accompany summer.

Possible Export Crops.

Among crops capable of withstanding the necessary long storage are:

(1) Papain
(2) Sisal
(3) Cotton
(4) Soya beans
(5) Peanuts
(6) Onions.

Papain.—Papaw trees grow readily and produce large numbers of fruit. If a suitable market could be four for papain this industry could be easily developed.

Sisal.—The Islands were once devoted to sisal. For the revival of this industry it would be necessary to la down a factory, but in view of present prices this will not now be recommended.

Cotton.—Insect pests found on the islands include

(a) Pink Boll Worm (*Platyedra gossypiella*);
(b) The Cotton Stainer (*Dysdercus spp.*)
(c) The Green Bug (*Nezara viridula*)

Before cotton can be established as an economic crop it is necessary to control these insects. With the preser facilities it is doubtful whether adequate supervision for a closed season could be imposed and so trouble may b expected from the Cotton Stainer and the Pink Boll Worm.

Soya Beans.—This has proved itself suited to the Caicos Islands and has given high yields.

Peanuts.—Very good yields have been realised from this crop and it is expected that this will be one of the majo crops in future years.

Onions.—The Red Teneriffe onion has grown well at Kew.

H. T. Carrington,
Agricultural Officer.

Annual Report Sugar Control Board, 1940-41.

Production.

The whole of the 1939-40 crop of sugar was purchased by the Imperial Government. Jamaica was instructe to manufacture as much sugar as possible during the quota period under review.

2. The production of the Island was, however, reduced by the effects of the storm which occurred in November 1939. The production figures for the 1939-40 crop are as follows:—

Sugar Exported	81,283.4 tons
Local Consumption	18,000.0 "
Total production	99,320.9 "
Muscovado production	37.5 "

3. Arrangements were made through the Ministry of Food for Jamaica to supply sugar to neighbouring Colonies

Registration of Cane Farmers.

4. In view of unrestricted production the same conditions for the registration of cane farmers continued t operate. Sugar manufacturers agreed to accept all canes of good quality which were delivered to them by registere farmers; licensing was therefore unnecessary. During the year 2,100 farmers were registered, making a total o 8,500.

5. The West Indies Sugar Company, Limited, with the approval of the Board, put into operation a cane farmers scheme at Winchester and Prospect Estates, based on the Fiji System.

Factories.

6. The factory known as Georgia was destroyed by fire and the Governor in Privy Council ordered and directe that it should be removed from the First Schedule of the Sugar Industry Control Law.

7. Applications for permits to erect and operate further factories were received and considered. The Boar recommended that in the present circumstances no new manufacturing licences should be granted under the Law

Scales.

8. Regulations controlling the scales on which canes were purchased were made under Sub-section (1) of Section 31 of the Law. The Regulations provide for the registration of such scales with the Sugar Control Board and eighty-two (82) scales of approved types were registered.

Cane Prices.

9. The Chairman undertook to certify that payments made to cane farmers for their cane were not less than that required by the standard form of contract.

Preference Certificates.

10. Following representations the Secretary of State agreed to the distribution of Preference Certificates on the basis of the exports of the current year's crop instead of on the average of the 1934-35 and 1935-36 crops, which had been the previous basis.

G. A. Jones,
Chairman.
H. H. Croucher,
Secretary.

12th August, 1941.